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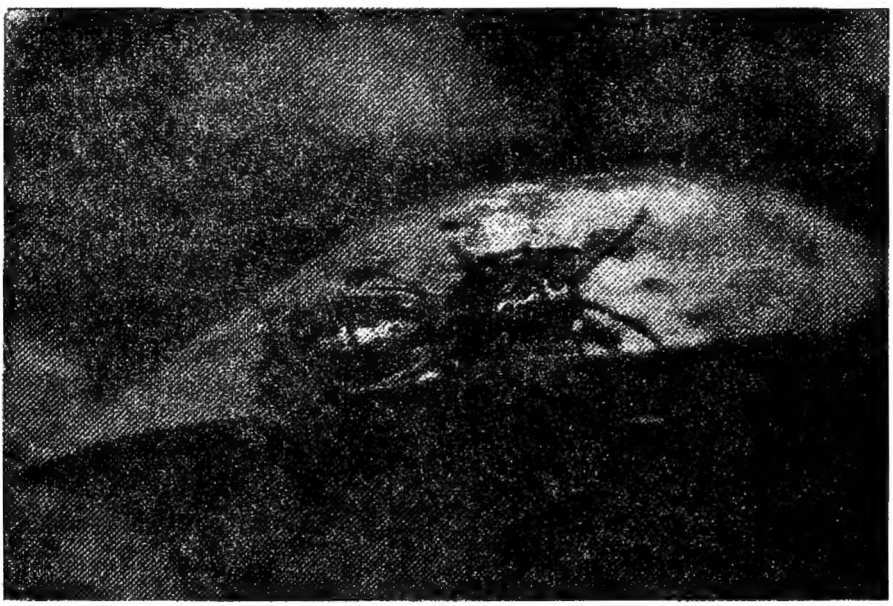

(Please see the article on page 64)

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DIVISION OF ENTOMOLOGY
INDIAN AGRICULTURAL RESEARCH INSTITUTE
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Felicitation

It is our proud privilege to announce the 1971 Ramon Magsaysay Prize worth $ 10,000 to Dr. M. S. Swaminathan, Director, Indian Agricultural Research Institute, New Delhi.

This award has been described as Asia's Nobel Prize. The press note released by the Board of Trustees is reproduced below :

"Dr. Moncompu Sambasiva Swaminathan, Director of the Indian Agricultural Research Institute, has been elected to receive the 1971 Ramon Magsaysay Award for Community Leadership.

Dr. Swaminathan is recognised for his contributions as scientist, educator of both students and farmers, and administrator toward generating a new confidence in India's agricultural capabilities.

Whether India, with nearly one-sixth of the human race, can provide sufficient food for her growing numbers in the years ahead depends ultimately upon her farmers. Their performance is closely linked to what science develops and makes operative in rural life. Without continuing refinement of relevant knowledge and its efficient transference, especially to the poorer villages, the "green revolution" may foster more discontent than it satisfies.

In an age when radioisotopes, a Gamma Garden and chemical mutagens are among the plant breeders' tools, Dr. Swaminathan is an originative follower of Gregor Johann Mendel, the Austrian monk and botanist who founded genetics over a century ago. A cytogeneticist, over the past 16 years he had made major advances in breeding sturdier, more productive and better quality plant types at the Pusa Institute, as the Indian Agricultural Research Institute outside of Delhi is popularly known. Included in his wide-ranging studies have been India's most essential food crops—rice, maize, sorghum, millet, pulses, potatoes and vegetable oils—plus improved strains of cotton and jute. By purpose-

ful manipulation of genes, he and his co-workers recently developed a dwarf, non-lodging wheat variety, Sharbati Sonora, with amber grains containing 16.5 per cent protein and three per cent lysine now alleviating the deficiency of essential amino acids in the Indian diet so harmful particularly to brain development in young children.

An ability and enthusiasm for passing on his knowledge to others in the laboratory, classroom and field and through prolific writings earned him a reputation as a most lucid educator. In the past five years since he became Director of the Institute, Swaminathan has proven himself an equaly gifted administrator.

Encouraged by him, scientists at Pusa extended their research to practical application in farmers' fields. University students also were enlisted in this attack upon the hurdles to a better life on the land. The primary demonstration arena for these efforts are villages around Delhi. Supplying improved seeds for testing by farmers with whom the Pusa Institute cooperates, scientists and students have won confidence in their productive potential. As part of a High-Yielding Varieties Program designed by Dr. Swaminathan, one community was transformed into a "seed village" specializing in controlled multiplication of improved varieties to supply the needs of the entire Delhi State.

This combination of talents has made Dr. Swaminathan an acknowledged leader of India's community of agriculturalists. Now 46 years of age, he is carrying forward his Madrasi family tradition of energetic personal emphasis upon professional excellence. That he is doing so with such broadly beneficial results for rural India is the mark of a first-rate scientist who also has become an effective humanist".

The editors, on their behalf and on behalf of the staff and students of the Division of Entomology, extend their heartiest congratulations to Director Swaminathan.

Editors

Role of Distantly-Related Natural Enemies in the Integrated Control of Pests

The giant African snail *Achatina fulica* Bowdich, a large-sized nocturnal land-snail, is a serious pest of fruits, vegetables, ornamentals and plantation crops. In India, it is a great menace on a number of islands of Andaman and Nicobar group. On the mainland, so far it has been reported from Assam, Bihar, Orissa, West Bengal, Kerala and Tamilnadu.

A few years ago the Government of India entrusted this problem to the Indian Agricultural Research Institute, New Delhi.

The studies carried out by the Division of Entomology of this Institute have led to certain interesting and useful findings. These reveal a useful principle which the entomologists may like to know for application in other fields.

The predatory millipede : A predatory millipede *Orthomorpha* sp. was observed predating on the giant African snail in Andamans. It secretes hydrocyanic acid from its stink glands a pair of which occur in each of its body segments except in a few anterior and postrior segments. By this secretion it paralyses the snail prior to starting feeding on it.

The hermit crabs : The Zoologists have taken lot of academic interest in hermit crabs but its usefulness in applied field has not been adequately appreciated. The hermit crabs are found on Andaman islands on sea shore where they breed and forage upto 2.4 Km. Therefore, the giant African snails in the interior of the island *i.e.*, beyond the range upto which hermit crabs travel are not subjected to predation by the hermit crab. Hence these were collected from the sea shore and released in *Achatina* pockets in the interior of the island where they live for about 4 to 6 months and carry out effective control of the snail pest. Effort is being made to simulate the sea shore conditions in artificial ponds in the interior of the island.

The pathogens : A Leucodermia-like disease was found to infect the giant African snail and it has been possible to infect the

healthy population of *Achatina* by spraying them with aquous suspension of the mascerated tissue of the diseased snails.

The most important finding during these studies has been that the predators, the hermit crab and the millipede, are not susceptible to the chemical molluscicide metaldehyde. Also the disease-causing organism does not infect the predators. Thus the control of the giant African snail can be carried out simultaneously by the use of the chemical molluscicide, the arthropod predators and the disease-causing micro-organisms. Such a spectacular compatibility of chemical and biological control does not seem to have been recorded so far. The useful principle involved seems to be that taxonomically the farther the groups are to which the pest and the biological control agent belong, the more there is safety margin between the two in the use of chemical pesticides. Thus in the present case, the pest belongs to phylum Mollusca and the predators to the phylum Arthropoda. *These successes highlight the need for keeping the principle of using distantly-related enemies, instead of closely-related ones, in view, while formulating integrated control programmes for pests.* Those dealing with Biological Control may well exploit this principle.

S. Pradhan & P. D. Srivastava

A new host record of *Vespa orientalis* Fabricius.

During a survey of the orchards of I.A.R.I., *V. orientalis* adults were found feeding voraciously on the fruits of *Pyrus communis var. locante*. The wasps scrape the epicarp and feed on the pulp upto a width of 3.8 cm and depth of 2.5 cm. Upto 13 wasps were seen feeding on a single fruit.

R. P. Srivastava

The grape-vine thrips, *Rhipiphorothrips cruentatus* Hood showing marked preference for Bhadauran variety of Mango.

Although the grape-vine thrips has been reported on mango by Ramakrishna Ayyar and Margabandhu (1939, *Indian. J. Ent.* 1 : 35-48) there is no record of varietal preference as yet. In May-

June, 1969, this thrips infested heavily two trees of Bhadauran variety in the orchard of the Horticulture Division of I.A.R.I., New Delhi while the trees of some other important varieties like Neelam, Banglora, Dashehari, Langra and Chausa were almost thrips free. It was also quite interesting to note two grafts of Neelam and Bhadauran made on the same single stalk showed a very severe infestation on the Bhadauran variety while Neelam was free.

D. S. Rathore* &
N. S. Bhattacherjee

Unusual Population of AK Grasshopper

In the month of June, 1971 reports of serious damage by AK grasshopper, *Poecilocerus pictus* Fabricius to cotton and other vegetable crops like *brinjal, lady's finger and cucurbits* were received from certain localised pockets of Sriganganagar district. The field survey revealed profuse breeding of the grasshoppers along canal bank, road side and field bunds where AK plants are found in abundance. These plants were completely defoliated and even the epidermal layer of stems had also been severely scraped through voracious feeding by nymphal and adult stages. The scarcity of main host plants compelled the developed population to migrate towards nearest crops and trees on field borders. *Few cotton fields were resown due to heavy damage.* Such severe damage has not been seen earlier in this area by these grasshoppers. It was estimated that 15 to 30 grasshoppers per plant were available which reduced to 2 or 3 per plant after 48 hours of BHC 10% dusting @ 25 kg/hectare.

R.M. Khan* & M.L. Sharma**

Severe Incidence of Painted Bug on Ragi

The painted bug, *Bagrada cruciferarum* Kirkaldy, is recorded as a pest of mustard, and some other cruciferous crops. In summer 1970 (March-June) serious infestation of this insect was observed on some 'ragi' *(Elucine coracana)* lines. This insect has not been recor-

* Division of Horticulture, I.A.R.I., New Delhi.
* Assistant Entomologist, ** Assistant Plant Protection Officer, Department of Agriculture, Durgapura, Jaipur.

ded on 'ragi', particularly as a serious pest. The ragi is one of the popular cereal crops in southern regions of the country particularly in the Mysore State and is not grown as a crop in Delhi area. Thus this new pest record is a consequence of introducing a new crop in an area where it was not grown earlier.

Severe infestation of the pest was again observed in summer 1971. Marked varietal differences were observed in the degree of infestation. Out of one hundred ninety five lines screened, fifty five lines had no or very little infestation.

K. K. Verma, G. C. Sharma & B. G. Srivastava

Artificial diet for the mass rearing of *Atherigona varia soccata* Rondani

The sorghum shootfly *A. varia soccata* has been successfully reared for the first time on a simple artificial diet. The diet consisted of 2 parts of agar, 0.3 parts of propionic acid and 5 parts of yeast in 93 parts of water. Larval and pupal periods on artificial diet were 9.7 days and 7.2 days as compared to 7.1 days and 8.3 days respectively, on natural diet (seedlings). The percentage pupation was 45.6 on the artificial diet and 75.0 on the natural diet. The percentage of adult emergence was 97.22 on natural diet and 90.0 on artificial diet. Efforts are being made to improve the diet further.

K. Dang, K.L. Dohare, B.G. Srivastava
& M.G. Jotwani

Neem Leaves attract White Grubs

Neem (*Melia indica*) leaves have been found to attract adults of *Holotrichia serrata* Fabricius grubs which are a serious pest of sugarcane roots during June-September. This information was confirmed in the laboratory and utilised in capturing adults of *H. serrata* at Rampur during June-July 1968 and 1969 and at Palhera Farm (Daurala) in district Meerut during May-July 1971 totalling 70,000, 85,000 and over 10,0000 respectively. The technique consists in planting fresh branches of 'neem' about 1.25 to 2 meters long before sunset in the infested area at the rate of 2 per hectare every day during the emergence season, that is, May-July, particularly during

the peak period. The adults are attracted probably by its smell but the exact chemical nature of the "Attractant" is yet to be determined. The adults which congregate on the branches for copulation and feeding can easily be captured and destroyed. High wind velocity in the evening, however, reduces its efficacy to some extent. Adults of *H. consanguinea* Blanch and *H. insularis* Brenske are also attracted to 'neem', leaves.

K.M. Gupta*

Polythene sacks for the control of insects in bagged grain

An interesting experiment was conducted by Wilkin and Green (1970)** to investigate the effectiveness of polythene sacks for the control of insect infestation in bagged grain. The experiment conducted at the Pest Infestation Laboratory, England showed that when confined in polythene outer sacks of 0.127 mm wall thickness, mixed populations of *Oryzaephilus surinamensis* Linnaeus and *Sitophilus granarius* Linnaeus were killed in about three days. Free living insects were killed more readily than the immature stages of *S. granarius* living within the grains. These observations once again highlight the usefulness of polythene film as an important tool for the control of storage pests and which has been fully exploited in the development, in this Division, of the "Pusa Bin" for grain storage as early as 1965.

P. B. Mookherjee

Effects of Fertilization and Insecticidal and Fungicidal Treatments on Yield of Cotton

Investigations on the effects of fertilization, insecticidal and fungicidal treatments on yield of cotton were conducted. The

*Cane Entomologist, Sugarcane Research Station, Muzaffarnagar (U.P.)

** Wilkin, D. R. and Green, A. A. 1970 *J. Stored Prod. Res. 6*. 97—101.

results were as follows :

Treatments	*% increase in yield*		*Remarks*
A. Fertilizer	21.7 *	69.6 †	120 Kg N+60 Kg P
B. Insecticide	43.9 *	289.3 †	8 sprayings
C. Copper oxychloride	7.1 *	81.5 †	8 sprayings
D. A+B+C	38.9 *	164.2 †	

The plots treated with fertilizer showed an increase in yield of cotton of 21.7 and 69.6 percent in varieties H-14 and Lockett, respectively. Eight applications of insecticides (4 of 0.03% monocrotophos, three of 0.1% carbaryl and one of 0.03% endrin) resulted in the increase in yield of 43.9 and 289.3 per cent in H-14 and Lockett, respectively. The plots treated 8 times with copper oxychloride showed 7.1 and 81.5 per cent increase in H-14 and Lockett. The increase in yield in plots treated with fertilizer plus insecticide plus fungicide was 38.9 and 164.2 per cent in H-14 and Lockett, respectively

The differences in yield in the insecticidal treated plots *vis-a-vis* the plots treated with insecticides plus fungicides plus fertilizer did not show any difference. It was interesting to note that the application of insecticides increased more yield compared to the application of fertilizers alone. The response of fertilizers and insecticides in the jassid susceptible variety Lockett were more marked than in the moderately jassid resistant variety H-14.

R. A. Agarwal, N. P. Wankhare** & K. N. Katiyar

Insecticides Act brought into force in India

The Government of India has brought into force all the provisions of the Insecticides Act, which was passed in 1968, with effect from August 1, 1971 to regulate their import, manufacture, sale,

* H—14
†Lockett.
** Division of Agronomy, I.A.R.I. New Delhi.

transport, distribution and use. This act extends to the whole of India.

With the regulatory and enforcement programme envisaged under this Act, it will be possible to minimize the risk of environmental pollution, eliminate hazards to the health and well being of human beings and animals from their use and ensure the supply of effective and safer chemicals to the farmers and the public.

V. S. Bhatnagar

Appointments

Shri M. L. Srivastava, Senior Research Assistant joined as Assistant Systematic Entomologist on 2.7.71.

Shri R. P. Srivastava, Research Assistant joined as Senior Research Assistant on 2.7.71.

Smt. K. Dang, Assistant Entomologist joined as Assistant Professor of Entomology on 12.7.71.

Shri R. P. Singh, Research Assistant joined as Senior Research Assistant on 15.7.71.

Shri Y. P. Beri, Junior Ornithologist joined as Ornithologist on 15 7.71.

Shri J. C. Pant, Assistant Physiologist joined as Insect Physiologist on 20.7.71.

Dr. P. B. Mookherjee, Junior Entomologist (Seed Testing) joined as Storage Entomologist on 21.7.71.

Shri L. D. Tiwari, Research Assistant joined as Senior Research Assistant on 25.8.71.

Dr. P. J. Rao, Research Assistant (Selection Grade) joined as Jr. Insect Physiologist on 26.8.71.

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